

**Patent and Trademark Office**Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO.
08/838,910	04/11/97	TANAKA	A 235648
			EXAMINER

A1M1/0815

CUSHMAN DARBY AND CUSHMAN  
INTELLECTUAL PROPERTY GROUP OF PILLSBURY  
MADISON AND SUTRO  
9TH FLR EAST TOWER 1100 NEW YORK AVE NW  
WASHINGTON DC 20005-3918

TUNGART UNIT PAPER NUMBER

1102  
DATE MAILED:

08/15/97

This is a communication from the examiner in charge of your application.  
COMMISSIONER OF PATENTS AND TRADEMARKS**OFFICE ACTION SUMMARY**

- ☐ Responsive to communication(s) filed on \_\_\_\_\_
- ☐ This action is **FINAL**.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 D.C. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

**Disposition of Claims**

- ☒ Claim(s) 1-19 is/are pending in the application.
- Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- ☒ Claim(s) 12-14 is/are allowed.
- ☒ Claim(s) 1-11, 15-19 is/are rejected.
- ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- ☐ Claim(s) \_\_\_\_\_ are subject to restriction or election requirements.

**Application Papers**

- ☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- ☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. § 119**

- ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- ☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been
- ☐ received.
- ☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_
- ☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

- ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e).

**Attachment(s)**

- ☐ Notice of Reference Cited, PTO-892
- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_
- ☐ Interview Summary, PTO-413
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Notice of Informal Patent Application, PTO-152

-SEE OFFICE ACTION ON THE FOLLOWING PAGES.-

BEST AVAILABLE COPY

Art Unit:

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Csanitz et al.

Csanitz discloses a heater 24 disposed within a solid electrolyte element. A layer of alumina 39 is located between the heater and the internal electrode of the solid electrolyte element and can be said to be either on the electrode's surface or on the heater's surface. See col. 3, line 14 to col. 4, line 27. The heater is considered to have a clearance from the internal electrode since the two are not adjoining or abutting.

As for claim 4, since the alumina layer comprises granules, its surface roughness is presumably more than 1 micron.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims, 4, 18, 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Csanitz et al.

Art Unit:

If layer 39 of Csanitz does not have a surface roughness of at least 1 micron, applicant's claim 1 differs in that respect. Claims 18 and 19 differ by calling for a certain thickness and porosity for the alumina layer.

There appears to be nothing critical for the recited roughness and thickness of claims 4 and 18, and they appear to be obviously desirable in light of the overall dimension of the sensor element. As for the porosity of claim 19, the layer clearly needs to be sufficiently porous so that the reference air (see col. 1, line 25 of the patent) can reach the internal electrode.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Csanitz et al alone or in view of Agarwal et al.

This claim differs by calling for the heater to have a polygonal cross-section.

Whether a heater is cylindrical or polygonal is a matter of design choice. In any event, Agarwal appears to show heater elements that are polygonal. See figure 1 and col. 2, line 23. It would have been obvious for Csanitz to adopt a polygonal heater in the absence of unexpected results.

Claims 1-4, 6-8, 18, 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Togawa et al in view of Sakurai et al.

Togawa discloses a solid electrolyte element with an internal electrode 14, which can be of SiC. See col. 3, line 51 to col. 4, line 16. Applicant's claims differ by calling for a heater to be disposed within the electrolyte element.

Art Unit:

Sakurai discloses the well-known expedient of locating a heater within a solid electrolyte element. See col. 3, line 47. A typical solid electrolyte element will not function as such at low, unheated temperatures. Thus, heating is needed. Externally located heaters are usually cumbersome in design or being too remote from the electrolyte. Therefore, it would have been obvious for Togawa to incorporate a heater within the electrolyte, as shown by Sakurai.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Togawa et al in view of Sakurai et al and Agarwal et al.

This claim further differs by calling for a polygonal heater. As discussed before, Agarwal renders such a heater configuration obvious.

Claims 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakurai et al in view of Agarwal et al.

Sakurai, as discussed before, discloses a conventional sensor element having a heater disposed therein. Applicant's claims differ by calling for the heater to be made of SiN, AlN or SiC.

Agarwal discloses SiN, AlN and SiC to be known materials for heaters. See col. 4, lines 10-19.

It would have been obvious for Sakurai to adopt a heater made from one of these materials, since the substitution of known features from analogous prior art is within the skill of the art.

Art Unit:

Claims 1-4, 6-8, 18, 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakurai et al in view of Hackh's.

Sakurai has been discussed before. Applicant's claims differ by calling for the the internal electrode to comprise a material (e.g. Pt black) having a specified emissivity.

Hackh's discloses platinum black to be a particularly active catalyst form of platinum. See page 529.

It would have been obvious to use the Pt black form of platinum for the platinum internal electrode of Sakurai, since Sakurai desires an electrode with high catalytic activity (see col. 3, line 40).

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sakurai et al in view of Hackh's and Agarwal et al.

This claim further differs by calling for a polygonal heater. As discussed before, Agarwal renders that obvious.

Claims 16, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakurai et al in view of Hackh's and Topp et al.

These claims further differ by calling for an outermost layer to be of a material having a lower emissivity than that of the internal electrode.

Topp discloses (col. 8, line 35) an outermost layer 6 on a sensor made of such materials as kaolin and feldspar, which presumably have a lower emissivity than Pt black.

Art Unit:

It would have been obvious for Sakurai to adopt the outer layer of Topp to protect its external electrode from the harsh ambient.

Claims 15-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

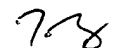
Claims 15 and 17, line 2, "said material having a high emissivity" is vague as well as having no antecedent basis.

Claim 16, line 5, "said surface of said internal electrode" has no antecedent basis.

Any inquiry concerning this communication should be directed to Ta Tung whose telephone number is (703) 308-3329.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor Ms. Kathryn Gorgos, can be reached on (703) 308-3328.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist at (703) 308-0661.

  
Ta Tung

PRIMARY EXAMINER

ART UNIT 1102